

CLAIMS

We claim:

1. A cutting guide assembly for use in performing surgery on the distal end of a condyle of a femur comprising

(i) a guide member having a slot for receiving and guiding a saw along a path defining a first plane; and

(ii) an arm assembly extending from said guide member, said arm assembly including (a) an arm surface engageable with the distal end of a condyle to be cut, said arm surface lying in a second plane spaced from said first plane and (b) a stylus extending into said first plane to limit the extent to which a saw extending through said slot can travel.

2. A cutting guide according to claim 1 wherein said stylus is sized relative to said guide member so as to be aligned with the sulcus between the condyle to be cut and the opposing condyle when said guide member is positioned against the lateral or medial aspect of said femur with said slot facing the lateral or medial aspect of said condyle to be cut.

3. A cutting guide assembly according to claim 1 further including an attachment member on said guide member engageable with a supplementary guide attached to a patient's tibia.

4. A cutting guide assembly according to claim 1 further including a first support tower engaged to said guide member, a first alignment rod supported on said first support tower, movement of said first alignment rod to a position generally parallel to the anatomical axis of said femur moving said saw guide assembly to a partially aligned position, a second support tower engaged to said guide member, and a second alignment rod supported on

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5 said second support tower, movement of said second alignment rod to a position generally parallel to said femur in the coronal plane as viewed in flexion extension moving said saw guide assembly to a fully aligned position with said first plane being substantially perpendicular to the mechanical axis of said femur.

10 5. A cutting guide assembly according to claim 1 wherein said arm assembly moveably mounted relative to said guide member and further including a connector member adjustable to (i) permit movement of said arm assembly relative to said guide member and (ii) fixedly secure said arm assembly to said guide member.

15 6. A cutting guide assembly according to claim 1 wherein said arm assembly is mounted for movement relative to said guide member, said movement being lateral or medial to said condyles when said guide member is positioned on the lateral or medial aspect of the patient's knee.

20 7. A cutting guide assembly according to claim 1 further including an attachment member engageable with a supplementary guide engaged to a patient's tibia or to a patient's distal femur, said attachment member including an adjustment track permitting movement of said guide member relative to said supplementary guide.

25 8. A cutting assembly according to claim 7 wherein said arm assembly is mounted for movement relative to said guide member, said movement being lateral or medial to said condyles when said guide member is positioned on the lateral or medial aspect of the patient's knee.

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9. A cutting assembly according to claim 7 wherein said supplementary guide is a foot guide having a toe engageable with said distal femur.

5 10. A cutting assembly according to claim 9 wherein said foot guide includes a track engageable with said cutting guide assembly, said track permitting movement of said cutting guide assembly laterally or medially of said femur when said toe is engaged to said distal femur.

10 11. A cutting guide assembly for use in knee surgery for cutting one or both condyles at the distal end of a femur having an anatomical axis and a mechanical axis comprising

15 (a) a guide having a first side with a face engageable with the medial or lateral aspect of a knee, said guide including an elongated slot for receiving a saw, said elongated slot extending through said guide from said first side to an opposing second side, a saw extending through said slot positioned to cut medially to laterally or laterally to medially along a cutting path when said face is so engaged,

20 (b) a first alignment support engaged to said guide;  
(c) a second alignment support engaged to said guide;  
(d) a first alignment rod engaged to said first alignment support; and  
(e) a second alignment rod engaged to said second alignment support.

25 12. A cutting guide assembly according to claim 11 wherein the positioning of

(a) said first alignment rod to a position substantially parallel to the anatomical axis of said femur; and

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(b) said second alignment rod to a position substantially parallel to said femur as viewed in flexion extension,

aligns said guide to a position such that a saw extending through said slot will be substantially perpendicular to the mechanical axis of said femur.

13. A cutting guide assembly according to claim 11 further including an arm assembly extending from said guide, said arm assembly including a surface spaced from and substantially parallel to said cutting path.

14. A cutting guide assembly according to claim 13 wherein said arm assembly includes a stylus extending into said cutting path.

15. A cutting guide assembly according to claim 13 wherein said arm assembly is adjustably movable on said guide.

16. A cutting guide assembly according to claim 11 wherein said first alignment support is removably supported on said guide and cooperates therewith to define a fixed angle between said cutting path and said first alignment rod.

17. A cutting guide assembly according to claim 11 wherein said first alignment support includes

(a) an aperture in said cutting guide, said aperture including a flat surface; and

(b) a support tower having an end stub sized to be received in said aperture, said end stub having a flat surface engageable with said aperture flat surface, said support tower having a hole for receiving said first

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alignment rod, said hole lying on an axis disposed at an angle relative to a plane defined by said stub flat surface.

5 18. A guide assembly according to claim 17 wherein said angle is in the range of  $1^{\circ}$  to  $10^{\circ}$ .

10 19. A cutting guide assembly according to claim 11 further including a base member adjustably secured to said cutting guide, said base member including an adjuster permitting movement of said base member relative to said cutting guide medially to laterally or laterally to medially.

15 20. A cutting guide assembly according to claim 19 in combination with an external support attached to the tibia adjacent said femur and said base member has a protuberance engageable with said external support.

20 21. A cutting guide assembly in accordance with claim 11 in combination with a foot guide, said foot guide having a first portion positioned to engage the distal end of said femur or said condyle and a second portion engageable with said cutting guide, said cutting guide movably adjustable on said foot guide medially to laterally or laterally.

25 22. A cutting guide assembly according to claim 11 further including (i) an extension on said guide disposed at substantially a right angle relative to said cutting path and, (ii) a combination adjustment member engageable with said extension for effecting adjustment in the proximal/distal direction and engageable with an external support member disposed in a fixed position relative to said femur distal end for effecting adjustment in the medial/lateral direction.

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23. A cutting guide assembly in accordance with claim 22 wherein said combination adjustment member includes a first track slideably engaged to said extension and a second track disposed at substantially a right angle to said first track, said second track being slideably engaged to said external support member.

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24. A cutting guide assembly in accordance with claim 23 wherein said external support member is a foot guide, said foot guide having a first portion positioned to engage the distal end of said femur or said condyle and a second portion engageable with said combination adjustment member second track.

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25. A cutting guide assembly in accordance with claim 11 wherein said guide second side includes a first segment substantially parallel to said first side and a second segment tapering away from said first segment and toward said first side.

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26. A cutting guide assembly in accordance with claim 25 wherein said first segment defines a first plane and said second segment defines a second plane disposed at an angle of  $45^\circ$  plus or minus  $20^\circ$  to said first plane and said slot passes through said first segment.

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27. A cutting guide assembly for use in knee surgery for cutting one or both condyles at the distal end of a femur having an anatomical axis and a mechanical axis comprising

(a) a guide having a first side with a face engageable with the medial or lateral aspect of a knee, said guide including an elongated slot for receiving a saw, said elongated slot extending through said guide from said first side to an opposing second side, a saw extending through said slot

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being positioned to cut medially to laterally or laterally to medially along a cutting path when said face is so engaged,

- (b) a first alignment support engaged to said guide;
- (c) a second alignment support engaged to said guide;
- 5 (d) a connector for adjustably securing said guide to an external support member disposed in a fixed position relative to said femur distal end, said connector permitting movement of said guide relative to said external support member medially to laterally or laterally to medially;
- (e) a first alignment rod engaged to said first alignment
- 10 support; and
- (f) a second alignment rod engaged to said second alignment support.

28. A cutting guide assembly in accordance with claim 27 wherein  
15 said connector includes a base member having a pair of tracks slideably engageable to said external support member.

29. A cutting guide assembly in accordance with claim 27 wherein  
20 said guide includes an extension disposed in a proximal/distal direction when said slot is positioned to cut medially to laterally or laterally to medially and said connector includes a combination adjustment member having a first track slideably engaged to said extension and a second track disposed at substantially a right angle to said first track, said second track being slideably  
25 engaged to said external support member.

30. A method of performing surgery on one or both condyles of a knee having first and second condyles at the distal end of a femur comprising the steps of

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(a) providing a cutting guide having a slot for receiving a saw blade, said blade when extending through said slot defining a first plane, first and second guide posts on said cutting guide, said first and second guide posts having means for receiving first and second guide rods, respectively, and an arm assembly having a surface lying on a second plane parallel to and spaced from said first plane;

(b) positioning said cutting guide such that said slot is facing said first condyle from the lateral or medial aspect;

(c) supporting said cutting guide externally of said femur;

(d) moving said cutting guide to align said first guide rod to a position parallel to the anatomical axis of said femur and said second guide rod to a position parallel to said femur as viewed in flexion extension; and

(e) moving said blade through said slot to cut the distal end from said first condyle in a medial to lateral direction or lateral to medial direction.

31. The method of claim 30 further including the step of positioning said arm assembly surface against the distal end of said first condyle prior to cutting said first condyle distal end.

32. The method of claim 30 wherein said arm assembly includes a distal end disposed away from said second plane and extending into said first plane and further including the step of positioning said arm assembly distal end between said first condyle and said second condyle.

33. The method of claim 30 further including the steps of (i) determining the angle between the mechanical axis and anatomical axis of said femur, (ii) engaging to said cutting guide a first guide post having engagement means for receiving said first guide rod, said engagement

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means providing angular orientation to said cutting guide based upon said angle such that said first plane will be substantially perpendicular to said mechanical axis when said first guide rod is parallel to said anatomical axis.

5           34.    The method of claim 30 further including the steps of providing an external support on the tibia adjacent said femur and further including the step of engaging said cutting guide to said external support.

10           35.    The method of claim 34 further including the step of moving said cutting guide laterally or medially following the steps of engaging said cutting guide to said external support.

15           36.    The method of claim 35 further including the step of moving said cutting guide along a line generally parallel to said anatomical axis.

20           37.    The method of claim 30 further including the steps of (i) providing a foot member having a first portion engageable with said cutting guide and a second portion extending therefrom and (ii) engaging said first portion to said cutting guide and said second portion to the distal end of said femur or one of said condyles.

25           38.    The method of claim 30 further including the step of continuing movement of said blade along the plane of the path traversed by said blade in step (e) to cut the distal end of said second condyle.

          39.    A method for performing knee surgery at the distal end of a femur having a first condyle and a second condyle spaced therefrom comprising the steps of

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(a) providing a cutting guide having a slot for receiving and guiding a cutting instrument, said cutting instrument, when extending therethrough, following a path defining a first plane;

5 (b) positioning said cutting guide with said slot facing the distal end of said first condyle from the medial or lateral aspect;

(c) supporting said cutting guide in said position externally of said femur; and

10 (d) cutting said first condyle distal end by moving said cutting instrument in a medial to lateral direction or in a lateral to medial direction.

40. The method of claim 39 further including the step of moving of said cutting instrument through said slot following step (d) to cut said second condyle.

15 41. The method according to claim 39 further including the step of blocking said first plane in the space between said first condyle and second condyle.

20 42. The method according to claim 39 wherein said cutting guide has an entrance side and an exit side and a blocking element extending into said first plane on said exit side and spaced from said exit side and further including the step of positioning said blocking element in the space between said first and second condyles.

25 43. The method according to claim 39 wherein said cutting guide includes a first support for a first guide rod and a second support for a second guide rod and further including the steps of aligning said first guide

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rod parallel to the anatomical axis of said femur and said second guide rod parallel to said femur when viewed in flexion extension.

5           44.    The method according to claim 39 wherein said cutting guide includes first engagement means for receiving a first support for a first guide  
rod and second engagement means for receiving a second support for a  
second guide rod, said first support cooperating with said first engagement  
means to compensate for the angular difference between the anatomical  
10   axis and mechanical axis of said femur and further including the steps of  
aligning said first guide rod parallel to said anatomical axis and said second  
guide rod parallel to said femur when viewed in flexion extension.

15           45.    The method according to claim 44 wherein there is provided a  
plurality of first supports for said first guide rods, each of said plurality, when  
cooperating with said first engagement means, compensating for one of a  
plurality of said angular differences and further including the steps of  
ascertaining said angular difference and engaging to said cutting guide the  
one of said plurality of first supports which most closely corresponds to said  
angular difference.

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          46.    The method according to claim 39 further including the step of  
engaging said cutting guide to an external support engaged to a tibia  
adjacent said femur.

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          47.    The method according to claim 39 further including the steps of  
providing a support member engageable with the distal end of said femur  
and further including the steps of engaging said support member to said  
distal end or one of said condyles and of engaging said cutting guide to said  
support member.

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